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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,543	11/26/2003	John R. Wootton	09813970-1635	9738

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EXAMINER	
HANDAL, KAITY V	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
10/23/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,543	WOOTTON ET AL.	
	Examiner	Art Unit	
	KAITY V. HANDAL	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 18-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hokari et al. (US 2003/0168381) in view of Wright et al. (USP 5,141,823).

Regarding claims 18-35, Hokari et al. discloses a system (Fig. 4) comprising hydrocarbon (3) and water feeds (2); a supercritical water (SCW) reactor (5); further including an oxygen feed (4) into the SCW reactor; further comprising a sensor and control system for monitoring at least one of said synthesis gas and said output gas and adjusting said feeds based on said sensing (see for example [0005]-[0018] and [0030]-[0031]).

While the reference teaches that the produced combustible gas can be used for energy generation (page 4, para. [0050]), it does not disclose another means of using said combustible gas for energy generation, namely using it in a fuel cell. Since to use combustible gas resulting from hydrocarbon reforming in a fuel cell was well known in the art at the time of the invention, as evidenced by Wright et al. (see for example abstract), it would have been obvious to one having ordinary skill in the art at the time of the invention to use said generated combustible gas of Hokari et al. in the fuel cell of Wright et al., as doing so would have amounted to nothing more

than to use a known material for its intended use in a known environment to accomplish an entirely expected result. Further examiner notes that an apparatus is not patentable where it is an obvious combination of two known elements, wherein each element lends to end products the desirable properties that each is known to produce when used alone and there exists no evidence of co-action between the elements that produces unexpected results. See In re Fortess and Schoeneberg, 152 USPQ 13 (CCPA 1966).

Wright additionally discloses that to use combustible gas in a fuel cell, the system needs to include a water-gas shift reactor (C5/L62-68 and C7/L50-65) and a capturing system to temporarily store that hydrogen gas before supplying it to the fuel cell (C 1/L54-C2/L5).

Hokari suggests pre-heating water (page 3, paragraph [0037]), which makes it obvious if not inherent that a preheater/(source of heat) (see Fig. 4, 25) to pre-heat the water to supercritical conditions prior to entering the reactor is disclosed therein, (see also page 2, para. [0030]). Furthermore, Hokari does teach having a fuel pre-heater/(fuel is preheated in mixing unit (fig. 4, 1) which is in direct thermal communication with said fuel feed and configured to preheat fuel to a predetermined temperature equal to or greater than the critical temperature of water once the fuel feed gets in direct contact with the supercritical water) (page 2, para. [0030]), the preheated fuel, air and water continue to mix in mixing means/(reactor (5)), which is similar to the instantly claimed mixing means.

Regarding limitations recited in claims 18-35 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device (as described by including claim limitations in process language versus structural limitations) nor material or article worked upon (diesel fuel) further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Response to Arguments

Prior Art

3. Applicant's arguments filed 6/23/2009 have been fully considered but they are not persuasive.

On Page 7, Applicant argues the following:

> "…Examiner now asserts that Hokari teaches having a fuel pre-heater where fuel is purportedly preheated in the mixer to a predetermined temperature equal to or greater than the critical temperature of water once the fuel feed gets in direct contact and mixes with the supercritical water before entering reactor (5)."
>
> …and
>
> That based on the law of energy conservation, mixing preheated water with fuel that is not preheated in mixer (1) lowers the temperature of water but does not preheat the fuel to a predetermined temperature equal or greater than the critical temperature of water. And that Hokari fails to teach "at least one preheater in thermal communication with said water feed and said diesel fuel and configured to heat water from said water feed and diesel fuel from said diesel fuel feed to a predetermined temperature equal to or greater than the critical temperature of water."

As previously presented by applicant, Examiner respectfully points out that applicant clarified that the mixing means instantly claimed is the SCW reactor itself; which in turn, allowed for interpreting the mixing means of Hokari, as set forth above, to be the fuel preheater in function, as set forth also in the previous Office Action. Hokari does teach having at least one preheater (fig. 4, 25) adapted to preheat the water to the supercritical temperature of water as set forth above (page 2, paragraph [0030); furthermore, Hokari teaches preheating the fuel in preheater/operating unit (1) wherein the fuel gets in direct contact with supercritical water prior to proceeding to the mixing means/(SCW reactor 5), and thereby, the fuel is preheated by a preheater/operating unit (1) configured to heat the fuel to a temperature equal or greater than the critical temperature of water as instantly claimed (page 1, paragraph [0012]; page 2, paragraph [0014] & [0030], lines 4-8, page 3, paragraph [0036]). Examiner disagrees that thermodynamically speaking, the fuel upon contact with the supercritical water will reduce the temperature of the water to below supercritical conditions, and therefore, the fuel is not preheated to a temperature at least above the supercritical temperature of water. It is clear in Hokari that high temperature and high pressure water in the supercritical state is mixed with the fuel (see Page 2, para. [0030]), furthermore, Hokari clearly states that premixing and preheating the fuel and water can be one alternative to feeding the fuel and water directly into the reactor (page 3, paragraph [0036]); additionally, Hokari clearly states that reactor (5) is operated at a temperature of 420^{o} C which is above the critical temperature of water (page 3, paragraph [0034]). Therefore, one skilled in the art would recognize

that it is desirable to maintain the temperature of the mixture of supercritical water and fuel at a temperature above the supercritical temperature of water in order to obtain a mixture whose temperature is as close as possible to the operating temperature in the reactor (5). Note that the critical temperature of water is 375° C which is well below 420° C; therefore, even when the premixing temperature of the supercritical water (which is not expressed in Hokari) drops as a result of mixing with fuel in the preheater (1), one skilled in the art would deduce Hokari's disclosure that it is desirable to have the provide a mixture of fuel and supercritical water at a temperature as close as possible to the reactor's (5) operating temperature of 420° C. Thereby, the fuel would have to be preheated by the supercritical water in the preheater (1) to a temperature above the critical temperature of water.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAITY V. HANDAL whose telephone number is (571)272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. V. H./ 10/17/09
Examiner, Art Unit 1795

/Jennifer K. Michener/
Supervisory Patent Examiner, Art Unit 1795